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VIA EMAIL AND OVERNIGHT DELIVERY

September 23, 2013

Mr. Bryce Bird
Director, Utah Division of Air Quality
State of Utah Department of Environmental Quality
195 North 1950 West
Salt Lake City, UT 84116

RECEIVED
SEP 24 2013
ECEJ-AT

**Re: White Mesa Uranium Mill,
National Emissions Standards for Radon Emission from Operating Mill Tailings
Transmittal of August 2013 Monthly Radon Flux Monitoring Report for Cell 2**

Dear Mr. Bird:

This letter transmits Energy Fuels Resources (USA) Inc.'s ("EFRI's") radon-222 flux monitoring report for August 2013 (the "Monthly Report") pursuant to 40 CFR 61.254(b), for Cell 2 at the White Mesa Uranium Mill (the "Mill"). Cell 2, which was constructed and placed into operation prior to December 15, 1989 is subject to the requirements in 40 CFR 61.252(a). As discussed in our 2012 Annual Radon Flux Monitoring Report submitted March 29, 2013, Cell 2 was not in compliance with the emissions limits in 40 CFR 61.252(a) of 20 pCi/(m²-sec) for the calendar year 2012. This Monthly Report is submitted pursuant to 40 CFR 261(b) which requires monthly reporting of monitoring data collected beginning the month immediately following the submittal of the annual report for the year in non-compliance.

Included with the Monthly Report is a Radon Flux Measurement Program Report, dated August 2013, prepared by Telco Environmental (the "Telco August 2013 Monthly Report"). The Telco August 2013 Monthly Report indicates that for the month of August 2013, the average radon flux from Cell 2 of 30.2 pCi/(m²-sec), did not comply with the standard in 40 CFR 61.252(a).

If you have any questions, please feel free to contact me at (303) 389-4132.

Yours very truly,

A handwritten signature in blue ink, appearing to read 'Jo Ann Tischler', is written over a light blue horizontal line.

Energy Fuels Resources (USA) Inc.
Jo Ann Tischler
Manager, Compliance and Licensing

Letter to B. Bird
September 23, 2013
Page 2 of 2

cc: David C. Frydenlund
Phil Goble, Utah DRC
Dan Hillsten
Rusty Lundberg, Utah DRC
Jay Morris, Utah DAQ
Harold R. Roberts
David E. Turk
Kathy Weinel
Director, Air and Toxics Technical Enforcement Program, Office of Enforcement, Compliance
and Environmental Justice, U. S. Environmental Protection Agency

Attachments

**ENERGY FUELS RESOURCES (USA) INC.
40 CODE OF FEDERAL REGULATIONS 61 SUBPART W**

**WHITE MESA MILL
SAN JUAN COUNTY, UTAH**

TAILINGS CELL 2 MONTHLY COMPLIANCE REPORT FOR AUGUST 2013

Submitted September 23, 2013

by

**Energy Fuels Resources (USA) Inc.
225 Union Blvd. Suite 600
Lakewood, Colorado 80228
(303) 974-2140**

1) Name and Location of the Facility

Energy Fuels Resources (USA) Inc. ("EFRI") operates the White Mesa Mill (the "Mill"), located in central San Juan County, Utah, approximately 6 miles (9.5 km) south of the city of Blanding. The Mill can be reached by private road, approximately 0.5 miles west of Utah State Highway 191. Within San Juan County, the Mill is located on fee land and mill site claims, covering approximately 5,415 acres, encompassing all or part of Sections 21, 22, 27, 28, 29, 32, and 33 of T37S, R22E, and Sections 4, 5, 6, 8, 9, and 16 of T38S, R22E, Salt Lake Base and Meridian.

All operations authorized by the Mill's State of Utah Radioactive Materials License are conducted within the confines of the existing site boundary. The milling facility currently occupies approximately 50 acres and the tailings disposal cells encompass another 275 acres.

2) Monthly Report

This Report is the monthly report for the Mill's Cell 2 for August 2013, required under 40 Code of Federal Regulations (CFR) 61.254(b).

A summary of the events that gave rise to the requirement to file this monthly report under 40 CFR 61.254(b) is set out in Section 4 of this Report. A summary of the radon emissions from Cell 2 measured in August 2013 is set out in Section 5 of this Report.

The monthly monitoring data for August 2013 required under 40 CFR 61.254(b) is provided in Attachment 1 to this Report, which contains the Radon Flux Measurement Program Report, dated August 2013, prepared by Telco Environmental (the "Telco August 2013 Monthly Report"). The results are summarized in Section 5 of this Report.

3) Name of the Person Responsible for Operation and Preparer of Report

Energy Fuels Resources (USA) Inc.
225 Union Boulevard, Suite 600
Lakewood, Colorado 80228
303.628.7798 (phone)
303.389.4125 (fax)

EFRI is the operator of the Mill and its tailings impoundments (Cells 2, 3, and 4A) and evaporation impoundments (Cells 1 and 4B). The Mill is an operating conventional uranium mill, processing both conventional ores and alternate feed materials. The "method of operations" at the Mill is phased disposal of tailings. Compliance with the NESHAP standards at 40 CFR 61.252(a) is determined annually for existing impoundments (i.e., Cells 2 and 3). The annual radon emissions for existing impoundments are measured using Large Area Activated Charcoal Canisters in conformance with 40 CFR, Part 61, Appendix B, Method 115, Restrictions to Radon Flux Measurements, (Environmental Protection Agency ["EPA"], 2008). These canisters are passive gas adsorption sampling devices used to determine the flux rate of Radon-222 gas from the surface of the tailings material. For impoundments licensed for use after December 15, 1989 (i.e., Cell 4A, and 4B), EFRI employs the work practice standard listed at 40 CFR 61.252(b)(1) in that all tailings impoundments constructed or licensed after that date are lined, are no more than 40 acres in area, and no more than two impoundments are operated for tailings disposal at any one time.

EFRI is submitting this monthly compliance report in conformance with the standards in 40 CFR 61.254(b).

4) Background Information -- Summary of 2012 Annual Report

Facility History

Cells 2 and 3, which have surface areas of 270,624 m² (approximately 66 acres) and 288,858 m² (approximately 71 acres), respectively, were constructed prior to December 15, 1989 and are considered “existing impoundments” as defined in 40 CFR 61.251. Radon flux from Cells 2 and 3 is monitored annually, as discussed below.

Cells 4A and 4B were constructed after December 15, 1989, and are subject to the work practice standards in 40 CFR 61.252(b)(1), which require that the maximum surface area of each cell not exceed 40 acres. For this reason, Cells 4A and 4B are not required to undergo annual radon flux monitoring.

Cell 3, which is nearly filled, and Cell 4A, receive the Mill’s tailings sands. Cells 1 and 4B, receive solutions only, and are in operation as evaporative ponds. Cell 2 is filled with tailings, is covered with an interim soil cover, and is no longer in operation.

Dewatering of Cell 2

The Utah Division of Water Quality issued Groundwater Discharge Permit (“GWDP”) UGW-370004 in 2005. Under Part I.D.3 of the current GWDP, EFRI has been required to accelerate dewatering of the solutions in the Cell 2 slimes drain. Dewatering of Cell 2 began in 2008. In mid-2011, changes were made in the pumping procedures for slimes drain dewatering of Cell 2 that resulted in an acceleration of dewatering since that time. As discussed in more detail below, studies performed by EFRI indicate that the increase in radon flux from Cell 2 has likely been caused by these dewatering activities. No other changes appear to have occurred in condition, use, or monitoring of Cell 2 that could have resulted in an increase in radon flux from the cell.

The average water level in the Cell 2 slimes drain standpipe for each of the years 2008 through 2012 indicate that water levels in Cell 2 have decreased approximately 3.25 feet (5600.56 to 5597.31 fmsl) since 2008. Of this decrease in water level, approximately 1 foot occurred between 2010 and 2011, reflecting the improved dewatering that commenced part way through 2011, and approximately 2 feet between 2011 and 2012, reflecting improved dewatering for all of 2012.

Radon Flux Monitoring of Cell 2

Telco performed the 2012 radon flux sampling during the second quarter of 2012 in the month of June. On June 25, 2012, Telco advised EFRI that the average radon flux for Cell 2 from samples taken in June 2012 was 23.1 pCi/(m²-sec) (referred to in the Telco report as pCi/m²-s), which exceeded the Subpart W requirement. The result of the 2012 radon-222 flux monitoring for Cell 3 was 18 pCi/(m²-sec). Cell 3, therefore, was in compliance with this standard for 2012.

40 CFR 61.253 provides that:

“When measurements are to be made over a one year period, EPA shall be provided with a schedule of the measurement frequency to be used. The schedule may be submitted to EPA prior to or after the first measurement period.”

EFRI advised the Utah Division of Air Quality (“DAQ”), by notices submitted on August 3 and September 14, 2012, that EFRI planned to collect additional samples from Cell 2 in the third and fourth quarters of 2012. These samples were collected on September 9, October 21, and November 21, 2012,

respectively. As the June 2012 monitoring for Cell 3 indicated that it was in compliance with the standard, further monitoring of Cell 3 was not performed.

The result of the 2012 radon-222 flux monitoring for Cell 2 was 25.9 pCi/(m²-sec) (averaged over four monitoring events). The measured radon flux from Cell 2 in 2012 therefore exceeded the standard in 40 CFR 61.252(a) of 20 pCi/(m²-sec).

The Cell 2 and Cell 3 radon flux results were reported in EFRI's 2012 Annual Radon Flux Monitoring Report (the "2012 Annual Report").

The provisions of 40 CFR 61.254(b) requires that:

"If the facility is not in compliance with the emission limits of paragraph 61.252 in the calendar year covered by the report, then the facility must commence reporting to the Administrator on a monthly basis the information listed in paragraph (a) of this section, for the preceding month. These reports will start the month immediately following the submittal of the annual report for the year in non-compliance and will be due 30 days following the end of each month."

This Report is the required monthly report for August 2013 for Cell 2. Monthly monitoring will continue until US EPA or DAQ determines that it is no longer required.

Evaluation of Potential Factors Affecting Radon Flux

In an attempt to identify the cause of the increase in radon flux at Cell 2, EFRI conducted a number of evaluations including:

- Excavation of a series of 10 test pits in the Cell 2 sands to collect additional information needed to ascertain factors affecting radon flow path and flux,
- Evaluation of radon trends relative to slimes drain dewatering,
- Development of correlation factors relating dewatering rates to radon flux, and
- Estimation of the thickness of temporary cover that would be required to achieve compliance with the radon flux standard of 20 pCi/(m²-sec), during the dewatering process.

These studies and results are discussed in detail in EFRI's 2012 Annual Radon Flux Report and summarized in the remainder of this section.

Slimes drain dewatering data indicate that a lowering of the water level in Cell 2 has resulted in an increase in the average radon flux, and that an increase in water level has resulted in a decrease in the average radon flux. Changes in radon flux have consistently been inversely proportional to changes in water levels in Cell 2 since 2008. For the last three years the change in radon flux has been between 3 and 5 pCi/(m²-sec) per each foot of change in water level. It is also noteworthy that the significant increases in radon flux from Cell 2 which occurred between 2010 and 2011 and between 2011 and 2012 coincided with the periods of improved (accelerated) dewatering of Cell 2.

EFRI has evaluated these results and has concluded that the increase in radon-222 flux from Cell 2 that has resulted in the exceedance of the 20 pCi/(m²-sec) standard in 40 CFR 61.252 (a) in 2012 is most likely the unavoidable result of Cell 2 dewatering activities mandated by the Mill's State of Utah GWDP. This is due to the fact that saturated tailings sands attenuate radon flux more than dry tailings sands, and

the thickness of saturated tailings sands decrease as dewatering progresses. There appear to have been no other changes in conditions at Cell 2 that could have caused this increase in radon flux from Cell 2. These conclusions are supported by evaluations performed by SENES Consultants Limited ("SENES"), who were retained by EFRI to assess the potential effects of dewatering on the radon flux from Cell 2 and to provide calculations of the thickness of temporary cover required to achieve the radon flux standard during the dewatering process.

SENES' evaluations were presented in a report provided as an attachment to EFRI's 2012 Annual Report. SENES estimated a theoretical radon flux from the covered tailings at Cell 2 for various depths (thicknesses) of dry tailings, and predicted future increases in radon flux as a function of decreases in water levels.

In order to explore potential interim actions that could be taken to maintain radon flux within the 20 pCi/(m²-sec) standard, the SENES study also evaluated the extent to which radon emanations from the cell can be reduced by increasing the thickness of the current interim cover on Cell 2.

5) August 2013 Results

Detailed results for August 2013 for Cell 2 are contained in the Tellco August 2013 Monthly Report. As described in the Tellco August 2013 Monthly Report, monitoring was performed consistent with 40 CFR 61 Subpart W Appendix B, Method 115 radon emissions reporting requirements. The radon monitoring consisted of 100 separate monitoring points at which individual radon flux measurements have been made by collection on carbon canisters. The individual radon flux measurements were averaged to determine compliance with 40 CFR Part 61.252.

The average radon flux for Cell 2 in August 2013 was reported by Tellco to be 30.2 pCi/(m²-sec). This radon flux value exceeds the 20 pCi/(m²-sec) standard in 40 CFR 61.252.

6) Other Information

Status of Proposed Updated Final Cover Design

As part of developing the Mill's final reclamation plan required to achieve the radon flux standard of 20 pCi/(m²-sec), a final engineered cover design was submitted by TITAN Environmental in 1996 and approved by the US Nuclear Regulatory Commission ("NRC"). An updated final cover design for the Mill's tailings system, submitted in November 2011, is under review by the Utah Division of Radiation Control ("DRC"), and is not currently approved. DRC provided a second round of interrogatories on the proposed cover design and associated Infiltration and Contaminant Transport Model ("ICTM") in February 2013, for which EFRI and its consultant, MWH Inc. are preparing responses.

7) Additional Information Required for Monthly Reports

a) Controls or Other Changes in Operation of the Facility

40 CFR 61.254(b)(1) requires that in addition to all the information required for an Annual Report under 40 CFR 61.254(b), monthly reports shall also include a description of all controls or other changes in operation of the facility that will be or are being installed to bring the facility into compliance.

Based on the evaluations described in Section 4, above, and as discussed during EFRI's March 27, 2013 meeting with DAQ and DRC staff, in addition to the monthly monitoring reported in this Monthly Report,

EFRI has proposed the following steps to ensure that radon emissions from Cell 2 are kept as low as reasonably achievable and to bring the facility into compliance with the applicable standard:

Construction and Monitoring of Interim Cover Test Area, and Application of Additional Random Fill

- i. EFRI proposes to construct and monitor a test-scale application to confirm the effect of the addition of one foot of additional soil cover. EFRI proposes to apply one foot of random fill at 90% compaction to a test area on Cell 2 of 100 feet by 100 feet. This test area would be established on or before September 2013 subject to DRC confirmation as discussed below. The radon flux in the test area would be measured both before and after placement of the additional fill and periodically over a six month period. Design of the test soil cover area is underway.
- ii. If the desired reduction (to within compliance levels) is achieved on the test area, EFRI will apply one foot of additional random fill at 90% compaction, to the remainder of Cell 2, on or before July 1, 2014. EFRI will perform the 2014 annual radon flux monitoring of Cell 2 after placement of the fill over the entire Cell 2 area.

The foregoing proposed test and construction activities will be conditional upon DRC confirming that such activities will not be prejudicial to or inconsistent with the final approved cover design currently under review, and will be credited toward the final cover design. As of the date of this report, EFRI has not received DRC's confirmation that the test and construction activities will not be prejudicial to or inconsistent with the final approved cover design, or will be credited toward the final cover design.

Interim Corrective Action

EFRI has taken the following additional steps to provide interim mitigation of radon flux from Cell 2. EFRI has identified the areas of elevated radon flux associated with known sources of radiological contamination at or near the surface of the cell cover. Specifically:

- the location associated with the former tailings discharge line,
- the perimeter area near the north of Cell 2 containing disturbed or windblown material, and
- the location of specific alternate feed tailings disposal with elevated radionuclide content.

EFRI has implemented corrective measures, which began in June 2013 and are in progress at the time of this monthly report. The corrective measures include the addition of cover material to the known source areas, and/or the excavation and reburying of any amount of contaminated material that may be detected at the surface of the source areas.

EFRI has completed an initial step of adding and compacting cover soil in a dry condition on Cell 2 during July 2013. This step has not affected the hot spots sufficiently to reduce the average flux to below the limit of 20 pCi/(m²-sec). The Mill's Contractor, Tellico, was only available for sampling on August 7, 2013. Subsequent to the August 7, 2013 sampling event, the Mill Personnel sprayed water and re-compacted the soil that had been added to Cell 2 during July 2013. Any effects on radon flux this modification will be expressed after the September 2013 monitoring event.

a) Facility's Performance Under Terms of Judicial or Administrative Enforcement Decree

The Mill is not under a judicial or administrative enforcement decree.

8) Certification

I Certify under penalty of law that I have personally examined and am familiar with the information submitted herein and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment. See 18, U.S.C. 1001.

Signed: _____

David C. Frydenlund

Senior Vice President, General Counsel and Corporate Secretary

Date: _____

September 23, 2013

ATTACHMENT 1

National Emissions Standards for Hazardous Air Pollutants

2013 Radon Flux Measurement Program

August 2013 Sampling Results

**National Emission Standards for Hazardous Air Pollutants
2013 Radon Flux Measurement Program**

**White Mesa Mill
6425 South Highway 191
Blanding, Utah 84511**

**August 2013 Sampling Results
Cell 2**

Prepared for: Energy Fuels Resources (USA) Inc.
6425 S. Highway 191
P.O. Box 809
Blanding, Utah 84511

Prepared by: Tellco Environmental
P.O. Box 3987
Grand Junction, Colorado 81502

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Appendix A. Charcoal Canister Analyses Support Documents

Appendix B. Recount Data Analyses

Appendix C. Radon Flux Sample Laboratory Data. Including Blanks

Appendix D. Sample Locations Map (Figure 2)

1. INTRODUCTION

During August 05-06, 2013 Tellco Environmental, LLC (Tellco) of Grand Junction, Colorado, provided support to Energy Fuels Resources (USA) Inc. (Energy Fuels) to conduct radon flux measurements regarding the required National Emission Standards for Hazardous Air Pollutants (NESHAPs) Radon Flux Measurements. These measurements are required of Energy Fuels to show compliance with Federal Regulations (further discussed in Section 3 below). The standard is not an average per facility, but is an average per radon source. The standard allows mill owners or operators the option of either making a single set of measurements or making measurements over a one year period (e.g., weekly, monthly, or quarterly intervals).

Energy Fuels is presently on a monthly radon flux sampling plan for Cell 2. This report presents the radon flux measurements results for Cell 2 for August 2013; the results of each monthly sampling event are presented in separate reports. Prior to 2012, Energy Fuels had chosen to make a single set of measurements to represent the radon flux each year; however, as the radon flux levels in Cell 2 began exceeding the regulatory standard of 20 picoCuries per square meter per second ($\text{pCi}/\text{m}^2\text{-s}$) in 2012, Energy Fuels decided to make the radon flux measurements on a more frequent basis.

During June and July 2013, Energy Fuels placed additional cover materials at selected sample locations of Cell 2 in an attempt to reduce the radon flux levels. The additional material was approximately 18-24 inches thick and approximately 100 feet in diameter, centered around selected sample location points where previous sampling had identified radon flux greater than $40 \text{ pCi}/\text{m}^2\text{-s}$.

Tellco was contracted to provide radon canisters, equipment, and canister placement personnel as well as lab analysis of samples. Energy Fuels personnel provided support for loading and unloading charcoal from the canisters. This report details the procedures employed by Energy Fuels and Tellco to obtain the results presented in Section 9.0 of this report.

2. SITE DESCRIPTION

The White Mesa Mill facility is located in San Juan County in southeastern Utah, six miles south of Blanding, Utah. The mill began operations in 1980 for the purpose of extracting uranium and vanadium from feed stocks. Processing effluents from the operation are deposited in four lined cells, which vary in depth. Cell 1, Cell 4A, and Cell 4B did not require radon flux sampling, as explained in Section 3 below.

Cell 2, which has a total area of approximately 270,624 square meters (m^2), has been filled and covered with interim cover. This cell is comprised of one region; a soil cover of varying thickness, which requires NESHAPs radon flux monitoring. The Cell 2 cover region is the same size in 2013 as it was in 2012. There are no exposed tailings or standing liquid within Cell 2.

Cell 3, which has a total area of 288,858 m^2 , is nearly filled with tailings sand and is undergoing pre-closure activities. This cell is comprised of two source regions that require NESHAPs radon monitoring: a soil cover region of varying thickness and an exposed tailings "beaches" region. The

remaining area is covered by standing liquid in lower elevation areas. The sizes of the regions vary due to the continuing advancement of interim cover materials and varying water levels.

3. REGULATORY REQUIREMENTS FOR THE SITE

Radon emissions from the uranium mill tailings at this site are regulated by the State of Utah's Division of Radiation Control and administered by the Utah Division of Air Quality under generally applicable standards set by the Environmental Protection Agency (EPA) for Operating Mills. Applicable regulations are specified in 40 CFR Part 61, Subpart W, National Emission Standards for Radon Emissions from Operating Mill Tailings, with technical procedures in Appendix B. At present, there are no Subpart T uranium mill tailings at this site. These regulations are a subset of the NESHAPs. According to subsection 61.252 Standard, (a) radon-222 emissions to ambient air from an existing uranium mill tailings pile shall not exceed an average of 20 pCi/m²-s for each pile or region. Subsection 61.253, Determining Compliance, states that: "Compliance with the emission standard in this subpart shall be determined annually through the use of Method 115 of Appendix B." The repaired Cell 4A, and newly constructed Cell 4B, were both constructed after December 15, 1989 and each was constructed with less than 40 acres surface area. Cell 4A and 4B comply with the requirements of 40 CFR 61.252(b), therefore no radon flux measurements are required on either Cell 4A or 4B.

4. SAMPLING METHODOLOGY

Radon emissions were measured using Large Area Activated Charcoal Canisters (canisters) in conformance with 40 CFR, Part 61, Appendix B, Method 115, Restrictions to Radon Flux Measurements, (EPA, 2012). These are passive gas adsorption sampling devices used to determine the flux rate of radon-222 gas from a surface. The canisters were constructed using a 10-inch diameter PVC end cap containing a bed of 180 grams of activated, granular charcoal. The prepared charcoal was placed in the canisters on a support grid on top of a ½ inch thick layer of foam and secured with a retaining ring under 1½ inches of foam (see Figure 1, page 10).

One hundred sampling locations were distributed throughout Cell 2 (which consisted of one region) as depicted on the Sample Locations Map (see Figure 2, Appendix D). Each charged canister was placed directly onto the surface (open face down) and exposed to the surface for 24 hours. Radon gas adsorbed onto the charcoal and the subsequent radioactive decay of the entrained radon resulted in radioactive lead-214 and bismuth-214. These radon progeny isotopes emit characteristic gamma photons that can be detected through gamma spectroscopy. The original total activity of the adsorbed radon was calculated from these gamma ray measurements using calibration factors derived from cross-calibration of standard sources containing known total activities of radium-226 with geometry identical to the counted samples and from the principles of radioactive decay.

After approximately 24 hours, the exposed charcoal was transferred to a sealed plastic sample container (to prevent radon loss and/or further exposure during transport), identified and labeled, and transported to the Telco laboratory in Grand Junction, Colorado for analysis. Upon completion of on-site activities, the field equipment was alpha and beta-gamma scanned for possible contamination resulting from fieldwork activities. All field equipment was surveyed by Energy Fuels Radiation Safety personnel and released for unrestricted use. Telco personnel maintained custody of the samples from collection through analysis.

5. FIELD OPERATIONS

5.1 Equipment Preparation

All charcoal was dried at 110°C before use in the field. Unused charcoal and recycled charcoal were treated the same. 180-gram aliquots of dried charcoal were weighed and placed in sample containers.

Proper balance operation was verified daily by checking a standard weight. The balance readout agreed with the known standard weight to within ± 0.1 percent.

After acceptable balance check, empty containers were individually placed on the balance and the scale was re-zeroed with the container on the balance. Unexposed and dried charcoal was carefully added to the container until the readout registered 180 grams. The lid was immediately placed on the container and sealed with plastic tape. The balance was checked for readout drift between readings.

Sealed containers with unexposed charcoal were placed individually in the shielded counting well, with the bottom of the container centered over the detector, and the background count rate was documented. Three five-minute background counts were conducted on ten percent of the containers, selected at random to represent the "batch". If the background counts were too high to achieve an acceptable lower limit of detection (LLD), the entire charcoal batch was labeled non-conforming and recycled through the heating/drying process.

5.2 Sample Locations, Identification, and Placement

On August 05, 2013, the sampling locations were spread out throughout the Cell 2 region. The same sampling locations that were established for the previous sampling of Cell 2 were used for the August 2013 sampling, although the actual sample identification numbers (ID) are different. An individual ID was assigned to each sample point, using a sequential alphanumeric system indicating the charcoal batch and physical location within the region (e.g., H01...H100). This ID was written on an adhesive label and affixed to the top of the canister. The sample ID, date, and time of placement were recorded on the radon flux measurements data sheets for the set of one hundred measurements.

Prior to placing a canister at each sample location, the retaining ring, screen, and foam pad of each canister were removed to expose the charcoal support grid. A pre-measured charcoal charge was selected from a batch, opened and distributed evenly across the support grid. The canister was then reassembled and placed face down on the surface at each sampling location. Care was exercised not to push the device into the soil surface. The canister rim was "sealed" to the surface using a berm of local borrow material.

Five canisters (blanks) were similarly processed and the canisters were kept inside an airtight plastic bag during the 24-hour testing period.

5.3 Sample Retrieval

On August 06, 2013 at the end of the 24-hour testing period, all canisters were retrieved, disassembled and each charcoal sample was individually poured through a funnel into a container. Identification numbers were transferred to the appropriate container, which was sealed and placed in a box for

transport. Retrieval date and time were recorded on the same data sheets as the sample placement information. The blank samples were similarly processed.

One of the canisters was inadvertently not loaded during the loading process and the sample location was identified (H91) during the unloading process. The charcoal samples from the remaining 99 canisters were successfully containerized during the unloading process.

5.4 Environmental Conditions

A rain gauge and thermometer were in place at the White Mesa Mill site to monitor rainfall and air temperatures during sampling in order to ensure compliance with the regulatory measurement criteria.

In accordance with 40 CFR, Part 61, Appendix B, Method 115:

- Measurements were not initiated within 24 hours of rainfall.
- Approximately 0.16 inches of rainfall occurred after placement of the canisters, but all of the canister seals remained intact and none of the canisters were surrounded by water.
- The minimum ambient air temperature during the sampling period was 66 degrees F.

6. SAMPLE ANALYSIS

6.1 Apparatus

Apparatus used for the analysis:

- Single- or multi-channel pulse height analysis system, Ludlum Model 2200 with a Teledyne 3" x 3" sodium iodide, thallium-activated (NaI(Tl)) detector.
- Lead shielded counting well approximately 40 cm deep with 5-cm thick lead walls and a 7-cm thick base and 5 cm thick top.
- National Institute of Standards and Technology (NIST) traceable aqueous solution radium-226 absorbed onto 180 grams of activated charcoal.
- Ohaus Model C501 balance with 0.1-gram sensitivity.

6.2 Sample Inspection and Documentation

Once in the laboratory, the integrity of each charcoal container was verified by visual inspection of the plastic container. Laboratory personnel checked for damaged or unsealed containers and verified that the data sheet was complete.

All of the 99 sample containers and 5 blank containers received and inspected at the Tellco analytical laboratory were verified as valid and no damaged or unsealed containers were observed.

6.3 Background and Sample Counting

The gamma ray counting system was checked daily, including background and radium-226 source measurements prior to and after each counting session. Based on calibration statistics, using two sources with known radium-226 content, background and source control limits were established for each Ludlum/Teledyne counting system with shielded well (see Appendix A).

Gamma ray counting of exposed charcoal samples included the following steps:

- The length of count time was determined by the activity of the sample being analyzed, according to a data quality objective of a minimum of 1,000 accrued counts for any given sample.
- The sample container was centered on the NaI detector and the shielded well door was closed.
- The sample was counted over a determined count length and then the mid-sample count time, date, and gross counts were documented on the radon flux measurements data sheet and used in the calculations.
- The above steps were repeated for each exposed charcoal sample.
- Approximately 10 percent of the containers counted were selected for recounting. These containers were recounted within a few days following the original count.

7. QUALITY CONTROL (QC) AND DATA VALIDATION

Charcoal flux measurement QC samples included the following intra-laboratory analytical frequency objectives:

- Blanks, 5 percent, and
- Recounts, 10 percent

All sample data were subjected to validation protocols that included assessments of sensitivity, precision, accuracy, and completeness. All method-required data quality objectives (EPA, 2012) were attained.

7.1 Sensitivity

A total of five blanks were analyzed by measuring the radon progeny activity in samples subjected to all aspects of the measurement process, excepting exposure to the source region. These blank sample measurements comprised approximately 5 percent of the field measurements. The results of the blank sample radon flux rates ranged from 0.00 to 0.03 pCi/m²-s, with an average of approximately 0.02 pCi/m²-s. The lower limit of detection (LLD) was approximately 0.03 pCi/m²-s.

7.2 Precision

Ten recount measurements, distributed throughout the sample set, were performed by replicating analyses of individual field samples (see Appendix B). These recount measurements comprised approximately 10 percent of the total number of samples analyzed. The precision of all recount

measurements, expressed as relative percent difference (RPD), ranged from less than 0.1 percent to 15.4 percent with an overall average precision of approximately 2.7 percent RPD. The precision of recount measurements that were above 1 pCi/m²-s ranged from less than 0.1 percent to 4.2 percent with an average of approximately 1.6 percent RPD.

7.3 Accuracy

Accuracy of field measurements was assessed daily by counting two laboratory control samples with known Ra-226 content. Accuracy of these lab control sample measurements, expressed as percent bias, ranged from approximately -2.9 percent to -1.2 percent. The arithmetic average bias of the lab control sample measurements was approximately -0.8 percent (see Appendix A).

7.4 Completeness

Ninety-nine out of the total one hundred samples from the Cell 2 Cover Region were verified, representing 99 percent completeness for the August 2013 radon flux sampling.

8. CALCULATIONS

Radon flux rates were calculated for charcoal collection samples using calibration factors derived from cross-calibration to sources with known total activity with identical geometry as the charcoal containers. A yield efficiency factor was used to calculate the total activity of the sample charcoal containers. Individual field sample result values presented were not reduced by the results of the field blank analyses.

In practice, radon flux rates were calculated by a database computer program. The algorithms utilized by the data base program were as follows:

Equation 8.1:

$$\text{pCi Rn-222/m}^2\text{sec} = \frac{N}{[T_s * A * b * 0.5^{(d/751)}]}$$

where: N = net sample count rate, cpm under 220-662 keV peak
 T_s = sample duration, seconds
 b = instrument calibration factor, cpm per pCi; values used:
 0.1699, for M-01/D-21 and
 0.1702, for M-02/D-20
 d = decay time, elapsed hours between sample mid-time and count mid-time
 A = area of the canister, m²

Equation 8.2:

$$\text{Error}_{2\sigma} = 2 \times \sqrt{\frac{\frac{\text{Gross Sample, cpm}}{\text{Sample Count, t, min}} + \frac{\text{Background Sample, cpm}}{\text{Background Count, t, min}}}{\text{Net, cpm}}} \times \text{Sample Concentration}$$

Equation 8.3:

$$L.L.D = \frac{2.71 + (4.65)(S_b)}{[Ts * A * b * 0.5^{(d/91.75)}]}$$

where: 2.71 = constant

4.65 = confidence interval factor

S_b = standard deviation of the background count rate

T_s = sample duration, seconds

b = instrument calibration factor, cpm per pCi; values used:

0.1699, for M-01/D-21 and

0.1702, for M-02/D-20

d = decay time, elapsed hours between sample mid-time and count mid-time

A = area of the canister, m^2

9. RESULTS

9.1 Mean Radon Flux

Referencing 40 CFR, Part 61, Subpart W, Appendix B, Method 115 - Monitoring for Radon-222 Emissions, Subsection 2.1.7 - Calculations, "the mean radon flux for each region of the pile and for the total pile shall be calculated and reported as follows:

- (a) The individual radon flux calculations shall be made as provided in Appendix A EPA 86(1). The mean radon flux for each region of the pile shall be calculated by summing all individual flux measurements for the region and dividing by the total number of flux measurements for the region.
- (b) The mean radon flux for the total uranium mill tailings pile shall be calculated as follows:

$$J_s = \frac{J_1 A_1 + \dots J_2 A_2 [+]\dots J_i A_i}{A_t}$$

Where: J_s = Mean flux for the total pile (pCi/ m^2 -s)

J_i = Mean flux measured in region i (pCi/ m^2 -s)

A_i = Area of region i (m^2)

A_t = Total area of the pile (m^2)"

40 CFR 61, Subpart W, Appendix B, Method 115, Subsection 2.1.8, Reporting states "The results of individual flux measurements, the approximate locations on the pile, and the mean radon flux for each region and the mean radon flux for the total stack [pile] shall be included in the emission test report. Any condition or unusual event that occurred during the measurements that could significantly affect the results should be reported."

9.2 Site Results

Site Specific Sample Results (reference Appendix C)

(a) The mean radon flux for the Cell 2 Cover Region at the site is as follows:

$$\text{Cell 2 - Cover Region} = 30.2 \text{ pCi/m}^2\text{-s (based on 270,624 m}^2\text{ area)}$$

Note: Reference Appendix C of this report for the entire summary of individual measurement results.

(b) Using the data presented above, the calculated mean radon flux for Cell 2 is, as follows:

$$\text{Cell 2} = 30.2 \text{ pCi/m}^2\text{-s}$$

$$\frac{(24.3)(270,624)}{270,624} = 30.2$$

As shown above, the arithmetic mean radon flux of the August 2013 samples for Cell 2 at Energy Fuels White Mesa milling facility is above the NRC and EPA standard of 20 pCi/m²-s. The extremely dry weather at the site for the past several years was especially severe during 2012 and is continuing now in 2013. The result of this dry weather is likely a lowered water table in the containment cell and reduced moisture content in surface soils, which could result in increased radon flux rates at the site.

The additional cover material placed at the selected locations of Cell 2 (refer to the "comments" column of the radon flux measurements spreadsheet in Appendix C) did not significantly reduce the radon flux rates at those locations. The permeability of the additional cover material is likely a result of low moisture content and partly because of the porosity of the materials used.

Appendix C presents the summary of individual measurement results, including blank sample analysis.

Sample locations are depicted on Figure 2, which is included in Appendix D. The map was produced by Tellico.

References

- U. S. Environmental Protection Agency, *Radon Flux Measurements on Gardiner and Royster Phosphogypsum Piles Near Tampa and Mulberry, Florida*, EPA 520/5-85-029, NTIS #PB86-161874, January 1986.
- U. S. Environmental Protection Agency, *Title 40, Code of Federal Regulations*, July 2012.
- U. S. Nuclear Regulatory Commission, *Radiological Effluent and Environmental Monitoring at Uranium Mills*, Regulatory Guide 4.14, April 1980.
- U. S. Nuclear Regulatory Commission, *Title 10, Code of Federal Regulations*, Part 40, Appendix A, January 2013.

Figure 1
Large Area Activated Charcoal Canisters Diagram

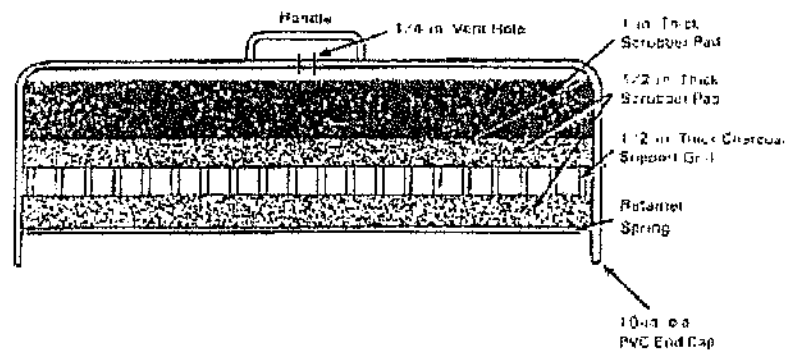


FIGURE 1 Large-Area Radon Collector

Appendix A

Charcoal Canister Analyses Support Documents

ACCURACY APPRAISAL TABLE
AUGUST 2013 SAMPLING

ENERGY FUELS RESOURCES
WHITE MESA MILL, BLANDING, UTAH
2013 NESHAPs RADON FLUX MEASUREMENTS
CELL 2
SAMPLING DATES: 08/05/13-08/06/13

[illegible]

SITE LOCATION: White Mesa Mill, Blanding, UT

Calibration Check Log

Technician:

The acceptable ranges were determined from prior background and source check data.

CHARCOAL CANISTER ANALYSIS SYSTEM

SITE LOCATION: White Mesa Mill, Blanding, UT

CLIENT: Energy Fuels Resources

Calibration Check Log

System ID: M-02/D-20 Calibration Date: 6/14/13 Due Date: 6/14/14

Scaler S/N: 51563 High Voltage: 1025 Window: 4.42 Thrshld: 2.20

Detector S/N: 041532 Source ID/SN: GS-05/Ra²²⁶ Source Activity: 59.3 kpc

Blank Canister Bkgd. Range, cpm: $2\sigma =$ 78 to 151 $3\sigma =$ 60 to 170

Gross Source Range, cpm: $2\sigma =$ 9844 to 10498 $3\sigma =$ 9683 to 10661

Technician: DL Coon

All counts times are one minute.

[illegible]

Y.N: Y = average background and source cpm falls within the control limits.

N = average background and source cpm does not fall within the control limits.

The acceptable ranges were determined from prior background and source check data.

BALANCE OPERATION DAILY CHECK

Balance Model: Ohaus Port-o-gram SN: 12307

Standard Weight (g): 200g.

[illegible]

Appendix B

Recount Data Analyses

CLIENT: ENERGY FUELS RESOURCES PROJECT: RADON FLUX MEASUREMENTS, WHITE MESA MILL

PROJECT NO.: 13004.00

PILE: 2

BATCH: H

SURFACE: SOIL

AIR TEMP MIN: 66°F

WEATHER: RAINED 0.16 in. AFTER PLACEMENT

AREA: COVER

DEPLOYED:

8 5 13

RETRIEVED:

8

6 13

CHARCOAL BKG:

142

cpm

Wt. Out:

180.0

g.

FIELD TECHNICIANS: CS,DLC

COUNTED BY: DLC

DATA ENTRY BY: DLC

TARE WEIGHT:

29.2

g.

COUNTING SYSTEM I.D.: M01/D21, M02/D20

CAL. DUE: 6/14/14

GRID LOCATION	SAMPLE I. D.	HR	MIN	RETRIV HR	MIN	ANALYSIS MO	DA	YR	MID-TIME HR	MIN	CNT (MIN)	GROSS COUNTS	GROSS WT IN	RADON pCi/m ² s	± pCi/m ² s	LLD pCi/m ² s	PRECISION % RPD
H10	H10	8	22	8	49	8	7	13	11	27	1	26837	224.4	45.4	4.5	0.03	
RECOUNT	H10	8	22	8	49	8	8	13	7	1	1	23826	224.4	46.7	4.7	0.04	2.8%
H20	H20	8	37	9	2	8	7	13	11	35	1	20339	218.1	34.4	3.4	0.03	
RECOUNT	H20	8	37	9	2	8	8	13	7	1	1	17536	218.1	34.3	3.4	0.04	0.3%
H30	H30	8	54	9	16	8	7	13	11	42	1	13268	222.0	22.4	2.2	0.03	
RECOUNT	H30	8	54	9	16	8	8	13	7	3	1	11785	222.0	23.0	2.3	0.04	2.6%
H40	H40	9	6	9	26	8	7	13	11	50	1	1753	218.2	2.7	0.3	0.03	
RECOUNT	H40	9	6	9	26	8	8	13	7	3	1	1489	218.2	2.7	0.3	0.04	0.0%
H50	H50	9	19	9	36	8	7	13	11	58	1	38734	218.1	66.0	6.6	0.03	
RECOUNT	H50	9	19	9	36	8	8	13	7	6	1	34968	218.1	68.8	6.9	0.04	4.2%
H60	H60	9	33	9	46	8	7	13	12	6	1	36096	219.3	61.6	6.2	0.03	
RECOUNT	H60	9	33	9	46	8	8	13	7	6	1	31792	219.3	62.6	6.3	0.04	1.6%
H70	H70	9	48	9	55	8	7	13	12	13	1	7073	227.9	11.9	1.2	0.03	
RECOUNT	H70	9	48	9	55	8	8	13	7	7	1	6313	227.9	12.2	1.2	0.04	2.5%
H80	H80	10	10	10	5	8	7	13	12	22	1	1002	221.8	1.5	0.2	0.03	
RECOUNT	H80	10	10	10	5	8	8	13	7	8	2	1746	221.8	1.5	0.2	0.04	0.0%
H90	H90	10	26	10	15	8	7	13	12	30	2	1011	217.0	0.6	0.1	0.03	
RECOUNT	H90	10	26	10	15	8	8	13	7	14	2	1001	217.0	0.7	0.1	0.04	15.4%
H100	H100	10	37	10	25	8	7	13	12	37	1	1019	216.4	1.5	0.2	0.03	
RECOUNT	H100	10	37	10	25	8	8	13	7	14	2	1788	216.4	1.5	0.2	0.04	0.0%
AVERAGE PERCENT PRECISION FOR THE CELL 2 COVER REGION:																	2.9%

Appendix C

Radon Flux Sample Laboratory Data (including Blanks)

CLIENT: ENERGY FUELS RESOURCES PROJECT: RADON FLUX MEASUREMENTS, WHITE MESA MILL

PROJECT NO.: 13004.00

PILE: 2

BATCH: H

SURFACE: SOIL

AIR TEMP MIN: 66°F

WEATHER: RAINED 0.16 in. AFTER PLACEMENT

AREA: COVER

DEPLOYED:

8 5 13

RETRIEVED:

8

6

13

CHARCOAL BKG:

142

FIELD TECHNICIANS: CS,DLC

COUNTED BY: DLC

DATA ENTRY BY: DLC

cpm

Wt. Out:

180.0

g.

COUNTING SYSTEM I.D.: M01/D21, M02/D20

CAL. DUE: 6/14/14

TARE WEIGHT:

29.2

g.

GRID LOCATION	SAMPLE I. D.	DEPLOY HR MIN	RETRIV HR MIN	ANALYSIS MO DA YR	MID-TIME HR MIN	CNT (MIN)	GROSS COUNTS	GROSS WT IN	RADON pCi/m ² s	± pCi/m ² s	LLD pCi/m ² s	COMMENTS:
H01	H01	8 12	8 39	8 7 13	11 20	1	2736	219.2	4.4	0.4	0.03	
H02	H02	8 14	8 40	8 7 13	11 20	1	16516	217.8	27.9	2.8	0.03	
H03	H03	8 15	8 41	8 7 13	11 21	1	1829	218.3	2.9	0.3	0.03	
H04	H04	8 16	8 42	8 7 13	11 21	1	28830	218.3	48.9	4.9	0.03	
H05	H05	8 17	8 43	8 7 13	11 24	2	1589	219.0	1.1	0.1	0.03	
H06	H06	8 18	8 44	8 7 13	11 23	1	1436	218.5	2.2	0.2	0.03	
H07	H07	8 19	8 45	8 7 13	11 26	1	4091	218.7	6.7	0.7	0.03	
H08	H08	8 20	8 46	8 7 13	11 26	1	17455	224.6	29.5	2.9	0.03	
H09	H09	8 21	8 47	8 7 13	11 27	1	2560	219.1	4.1	0.4	0.03	
H10	H10	8 22	8 49	8 7 13	11 27	1	26837	224.4	45.4	4.5	0.03	NEW COVER
H11	H11	8 23	8 50	8 7 13	11 29	1	19518	218.9	33.0	3.3	0.03	
H12	H12	8 24	8 51	8 7 13	11 29	1	35584	220.8	60.3	6.0	0.03	NEW COVER
H13	H13	8 25	8 53	8 7 13	11 31	1	23690	220.1	40.1	4.0	0.03	NEW COVER
H14	H14	8 27	8 55	8 7 13	11 31	1	14220	219.5	23.9	2.4	0.03	
H15	H15	8 29	8 56	8 7 13	11 32	1	7241	219.7	12.1	1.2	0.03	
H16	H16	8 31	8 57	8 7 13	11 32	1	2695	215.8	4.3	0.4	0.03	
H17	H17	8 33	8 59	8 7 13	11 33	1	31467	199.8	53.4	5.3	0.03	
H18	H18	8 35	9 0	8 7 13	11 33	1	29408	217.8	49.8	5.0	0.03	
H19	H19	8 36	9 1	8 7 13	11 35	1	25004	217.4	42.4	4.2	0.03	
H20	H20	8 37	9 2	8 7 13	11 35	1	20339	218.1	34.4	3.4	0.03	
H21	H21	8 38	9 4	8 7 13	11 36	1	36256	216.9	61.6	6.2	0.03	NEW COVER
H22	H22	8 40	9 6	8 7 13	11 36	1	28959	219.8	49.0	4.9	0.03	
H23	H23	8 42	9 7	8 7 13	11 38	1	22466	216.9	38.1	3.8	0.03	
H24	H24	8 44	9 9	8 7 13	11 38	1	24101	220.0	40.8	4.1	0.03	NEW COVER
H25	H25	8 45	9 11	8 7 13	11 39	1	37238	215.5	63.2	6.3	0.03	
H26	H26	8 47	9 12	8 7 13	11 39	1	2413	219.3	3.9	0.4	0.03	
H27	H27	8 50	9 13	8 7 13	11 41	1	22328	218.8	37.9	3.8	0.03	NEW COVER
H28	H28	8 52	9 14	8 7 13	11 41	1	15442	218.0	26.1	2.6	0.03	
H29	H29	8 53	9 15	8 7 13	11 42	1	71346	215.5	121.6	12.2	0.03	
H30	H30	8 54	9 16	8 7 13	11 42	1	13268	222.0	22.4	2.2	0.03	
H31	H31	8 55	9 17	8 7 13	11 44	1	49186	219.1	83.8	8.4	0.03	NEW COVER
H32	H32	8 56	9 18	8 7 13	11 44	1	25832	216.8	43.8	4.4	0.03	
H33	H33	8 57	9 19	8 7 13	11 45	1	29488	218.5	50.1	5.0	0.03	NEW COVER
H34	H34	8 59	9 20	8 7 13	11 45	1	3873	218.1	6.4	0.6	0.03	
H35	H35	9 0	9 21	8 7 13	11 47	1	20306	225.2	34.5	3.4	0.03	NEW COVER
H36	H36	9 2	9 22	8 7 13	11 47	1	47714	222.3	81.2	8.1	0.03	
H37	H37	9 3	9 23	8 7 13	11 48	1	20136	222.6	34.2	3.4	0.03	

CLIENT: ENERGY FUELS RESOURCES PROJECT: RADON FLUX MEASUREMENTS, WHITE MESA MILL

PROJECT NO.: 13004.00

PILE: 2 BATCH: H SURFACE: SOIL AIR TEMP MIN: 66°F
 AREA: COVER DEPLOYED: 8 5 13 RETRIEVED: 8 6 13 CHARCOAL BKG: 142
 FIELD TECHNICIANS: CS,DLC COUNTED BY: DLC DATA ENTRY BY: DLC
 COUNTING SYSTEM I.D.: M01/D21, M02/D20 CAL. DUE: 6/14/14

WEATHER: RAINED 0.16 in. AFTER PLACEMENT
 cpm Wt. Out: 180.0 g.
 TARE WEIGHT: 29.2 g.

GRID LOCATION	SAMPLE I. D.	DEPLOY HR MIN	RETRIV HR MIN	ANALYSIS MO DA YR	MID-TIME HR MIN	CNT (MIN)	GROSS COUNTS	GROSS WT IN	RADON pCi/m ² s	± pCi/m ² s	LLD pCi/m ² s	COMMENTS:
H38	H38	9 4	9 24	8 7 13	11 48	1	1370	221.3	2.1	0.2	0.03	
H39	H39	9 5	9 25	8 7 13	11 50	1	29180	220.5	49.6	5.0	0.03	NEW COVER
H40	H40	9 6	9 26	8 7 13	11 50	1	1753	218.2	2.7	0.3	0.03	
H41	H41	9 7	9 27	8 7 13	11 52	1	5632	220.4	9.4	0.9	0.03	
H42	H42	9 9	9 28	8 7 13	11 52	1	1029	222.2	1.5	0.2	0.03	
H43	H43	9 10	9 29	8 7 13	11 54	1	1065	222.5	1.6	0.2	0.03	NEW COVER
H44	H44	9 11	9 30	8 7 13	11 54	1	58019	224.3	98.8	9.9	0.03	NEW COVER
H45	H45	9 12	9 31	8 7 13	11 55	1	196935	224.8	336.6	33.7	0.03	NEW COVER
H46	H46	9 14	9 32	8 7 13	11 55	1	5985	218.9	10.0	1.0	0.03	
H47	H47	9 15	9 33	8 7 13	11 57	1	41586	217.8	70.9	7.1	0.03	
H48	H48	9 17	9 34	8 7 13	11 57	1	43219	222.5	73.6	7.4	0.03	NEW COVER
H49	H49	9 18	9 35	8 7 13	11 58	1	14408	219.4	24.4	2.4	0.03	
H50	H50	9 19	9 36	8 7 13	11 58	1	38734	218.1	66.0	6.6	0.03	
H51	H51	9 20	9 37	8 7 13	12 0	1	10921	221.6	18.5	1.8	0.03	
H52	H52	9 21	9 38	8 7 13	12 0	1	21257	219.0	36.1	3.6	0.03	
H53	H53	9 23	9 39	8 7 13	12 1	1	3966	221.3	6.6	0.7	0.03	
H54	H54	9 24	9 40	8 7 13	12 1	1	19719	217.1	33.5	3.3	0.03	
H55	H55	9 26	9 41	8 7 13	12 3	1	7026	218.1	11.8	1.2	0.03	
H56	H56	9 27	9 42	8 7 13	12 3	1	63963	218.2	109.2	10.9	0.03	
H57	H57	9 29	9 43	8 7 13	12 4	1	15570	218.1	26.5	2.6	0.03	NEW COVER
H58	H58	9 30	9 44	8 7 13	12 4	1	11747	216.1	19.9	2.0	0.03	
H59	H59	9 31	9 45	8 7 13	12 6	1	9062	216.7	15.3	1.5	0.03	
H60	H60	9 33	9 46	8 7 13	12 6	1	36096	219.3	61.6	6.2	0.03	NEW COVER
H61	H61	9 34	9 47	8 7 13	12 7	1	5596	215.9	9.4	0.9	0.03	
H62	H62	9 36	9 48	8 7 13	12 7	1	5657	217.2	9.5	0.9	0.03	
H63	H63	9 38	9 49	8 7 13	12 9	1	2858	218.2	4.7	0.5	0.03	
H64	H64	9 39	9 50	8 7 13	12 9	1	38722	226.5	66.2	6.6	0.03	NEW COVER
H65	H65	9 41	9 51	8 7 13	12 10	1	18851	217.4	32.2	3.2	0.03	
H66	H66	9 43	9 52	8 7 13	12 10	1	26117	219.9	44.6	4.5	0.03	
H67	H67	9 44	9 53	8 7 13	12 12	1	24138	224.6	41.3	4.1	0.03	
H68	H68	9 45	9 54	8 7 13	12 12	1	3035	219.4	5.0	0.5	0.03	
H69	H69	9 46	9 54	8 7 13	12 13	1	5095	219.6	8.5	0.9	0.03	
H70	H70	9 48	9 55	8 7 13	12 13	1	7073	227.9	11.9	1.2	0.03	
H71	H71	9 49	9 56	8 7 13	12 15	1	24177	219.6	41.4	4.1	0.03	
H72	H72	9 50	9 57	8 7 13	12 15	1	23512	221.0	40.2	4.0	0.03	
H73	H73	9 51	9 58	8 7 13	12 16	1	22468	220.0	38.4	3.8	0.03	
H74	H74	9 52	9 59	8 7 13	12 16	1	14725	218.7	25.1	2.5	0.03	

CLIENT: ENERGY FUELS RESOURCES PROJECT: RADON FLUX MEASUREMENTS, WHITE MESA MILL

PROJECT NO.: 13004.00

PILE: 2

BATCH: H

SURFACE: SOIL

AIR TEMP MIN: 66°F

AREA: COVER

DEPLOYED:

8 5 13

RETRIEVED:

8

6

13

CHARCOAL BKG:

142

WEATHER: RAINED 0.16 in. AFTER PLACEMENT

FIELD TECHNICIANS: CS,DLC

COUNTED BY: DLC

DATA ENTRY BY: DLC

cpm

Wt. Out:

180.0

g.

COUNTING SYSTEM I.D.: M01/D21, M02/D20

CAL. DUE: 6/14/14

TARE WEIGHT:

29.2

g.

GRID LOCATION	SAMPLE I. D.	DEPLOY HR MIN	RETRIV HR MIN	ANALYSIS MO DA YR	MID-TIME HR MIN	CNT (MIN)	GROSS COUNTS	GROSS WT IN	RADON pCi/m ² s	± pCi/m ² s	LLD pCi/m ² s	COMMENTS:
H75	H75	9 53	10 0	8 7 13	12 18	1	1417	220.5	2.2	0.2	0.03	
H76	H76	9 55	10 1	8 7 13	12 18	1	1454	219.7	2.3	0.2	0.03	
H77	H77	10 7	10 2	8 7 13	12 20	2	1110	219.6	0.7	0.1	0.03	
H78	H78	10 8	10 3	8 7 13	12 19	1	1468	221.1	2.3	0.2	0.03	
H79	H79	10 9	10 4	8 7 13	12 22	1	3569	217.6	5.9	0.6	0.03	
H80	H80	10 10	10 5	8 7 13	12 22	1	1002	221.8	1.5	0.1	0.03	
H81	H81	10 11	10 6	8 7 13	12 23	1	7293	219.7	12.4	1.2	0.03	
H82	H82	10 13	10 7	8 7 13	12 23	1	11623	215.5	19.9	2.0	0.03	
H83	H83	10 14	10 8	8 7 13	12 25	1	16303	217.8	28.1	2.8	0.03	
H84	H84	10 16	10 9	8 7 13	12 25	1	2353	217.5	3.8	0.4	0.03	
H85	H85	10 17	10 10	8 7 13	12 26	1	4569	222.8	7.7	0.8	0.03	
H86	H86	10 18	10 11	8 7 13	12 26	1	7615	224.6	13.0	1.3	0.03	
H87	H87	10 19	10 12	8 7 13	12 28	1	3637	217.4	6.1	0.6	0.03	
H88	H88	10 20	10 13	8 7 13	12 28	1	5797	215.9	9.8	1.0	0.03	
H89	H89	10 25	10 14	8 7 13	12 29	1	10787	216.9	18.5	1.9	0.03	
H90	H90	10 26	10 15	8 7 13	12 30	2	1011	217.0	0.6	0.1	0.03	
H91	H91	10 28	10 16					207.9				NOT LOADED
H92	H92	10 29	10 17	8 7 13	12 32	1	2452	217.5	4.0	0.4	0.03	
H93	H93	10 30	10 18	8 7 13	12 33	1	7103	218.2	12.1	1.2	0.03	
H94	H94	10 32	10 19	8 7 13	12 33	1	2435	221.0	4.0	0.4	0.03	
H95	H95	10 33	10 20	8 7 13	12 34	1	1548	218.1	2.5	0.2	0.03	
H96	H96	10 34	10 21	8 7 13	12 34	1	1952	217.6	3.1	0.3	0.03	
H97	H97	10 35	10 22	8 7 13	12 36	1	16394	222.2	28.3	2.8	0.03	
H98	H98	10 36	10 23	8 7 13	12 36	1	2667	218.7	4.4	0.4	0.03	
H99	H99	10 37	10 24	8 7 13	12 37	1	1329	221.3	2.1	0.2	0.03	
H100	H100	10 37	10 25	8 7 13	12 37	1	1019	216.4	1.5	0.2	0.03	
AVERAGE RADON FLUX RATE FOR THE CELL 2 COVER REGION:									30.2	pCi/m ² s		

BLANK CANISTER ANALYSIS:

GRID LOCATION	SAMPLE I. D.	DEPLOY HR MIN	RETRIV HR MIN	ANALYSIS MO DA YR	MID-TIME HR MIN	CNT (MIN)	GROSS COUNTS	GROSS WT IN	RADON pCi/m ² s	± pCi/m ² s	LLD pCi/m ² s	COMMENTS:
H BLANK 1	H BLANK 1	7 32	8 50	8 7 13	10 30	10	1587	209.9	0.03	0.02	0.03	CONTROL
H BLANK 2	H BLANK 2	7 32	8 50	8 7 13	10 30	10	1486	208.1	0.01	0.02	0.03	CONTROL
H BLANK 3	H BLANK 3	7 32	8 50	8 7 13	10 42	10	1604	210.0	0.03	0.02	0.03	CONTROL
H BLANK 4	H BLANK 4	7 32	8 50	8 7 13	10 42	10	1443	211.9	0.00	0.02	0.03	CONTROL
H BLANK 5	H BLANK 5	7 32	8 50	8 7 13	10 54	10	1598	210.1	0.03	0.02	0.03	CONTROL
AVERAGE BLANK CANISTER ANALYSIS FOR THE CELL 2 COVER REGION:									0.02	pCi/m ² s		

Appendix D

Sample Locations Map (Figure 2)

WHITE MESA MILL
BLANDING, UTAH
NESHAPS 2013

SAMPLE LOCATIONS MAP
AUGUST 2013

PREPARED FOR
ENERGY FUELS RESOURCES

LEGEND

10-1 2 SAMPLE LOCATION
CAPPED AREA

FIGURE 2



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